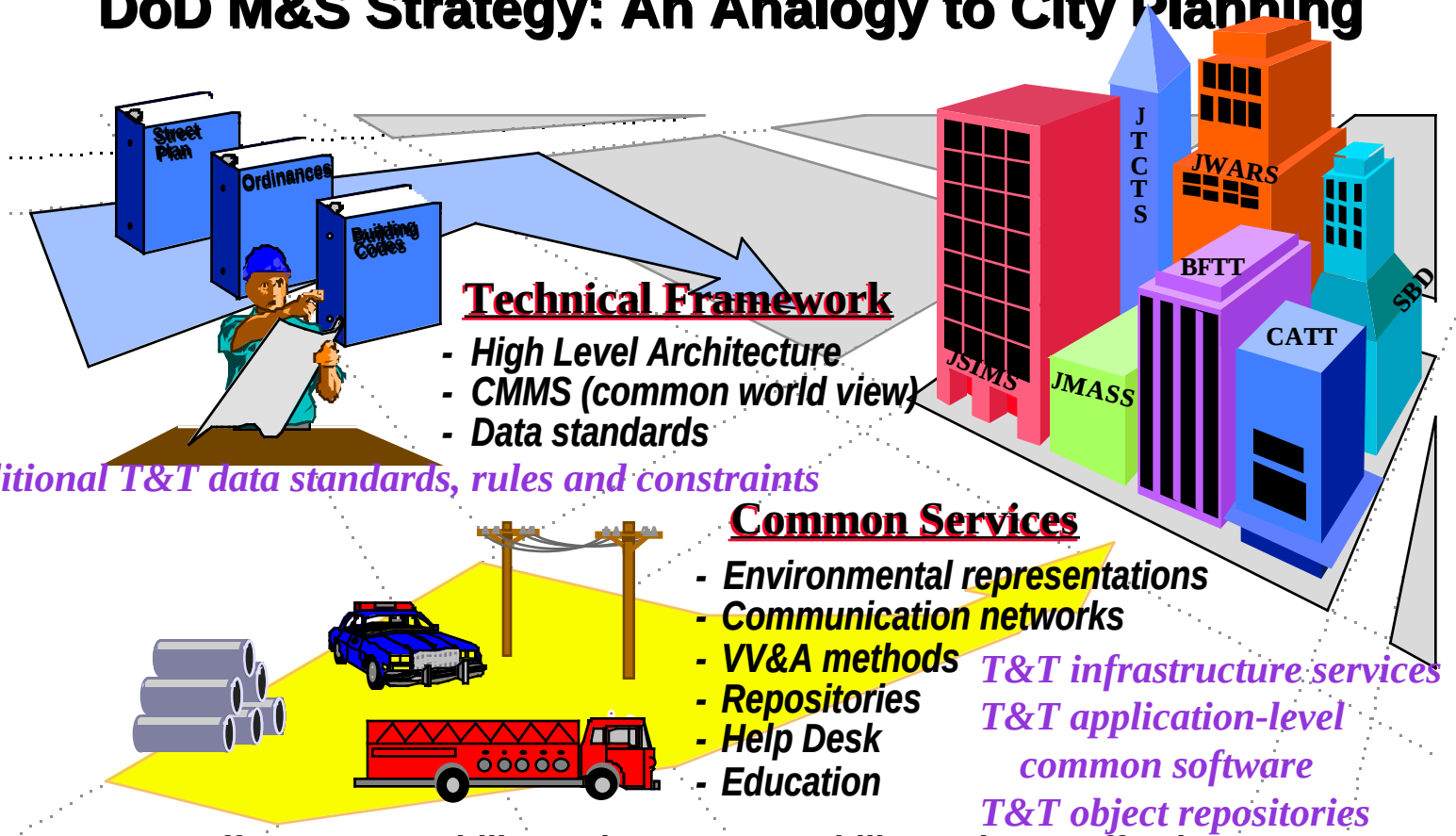
HLA as a Foundation for Test & Training Ranges

DoD M&S Strategy: An Analogy to City Planning



Technical Framework

- *High Level Architecture*
- *CMMS (common world view)*
- *Data standards*

Additional T&T data standards, rules and constraints

Common Services

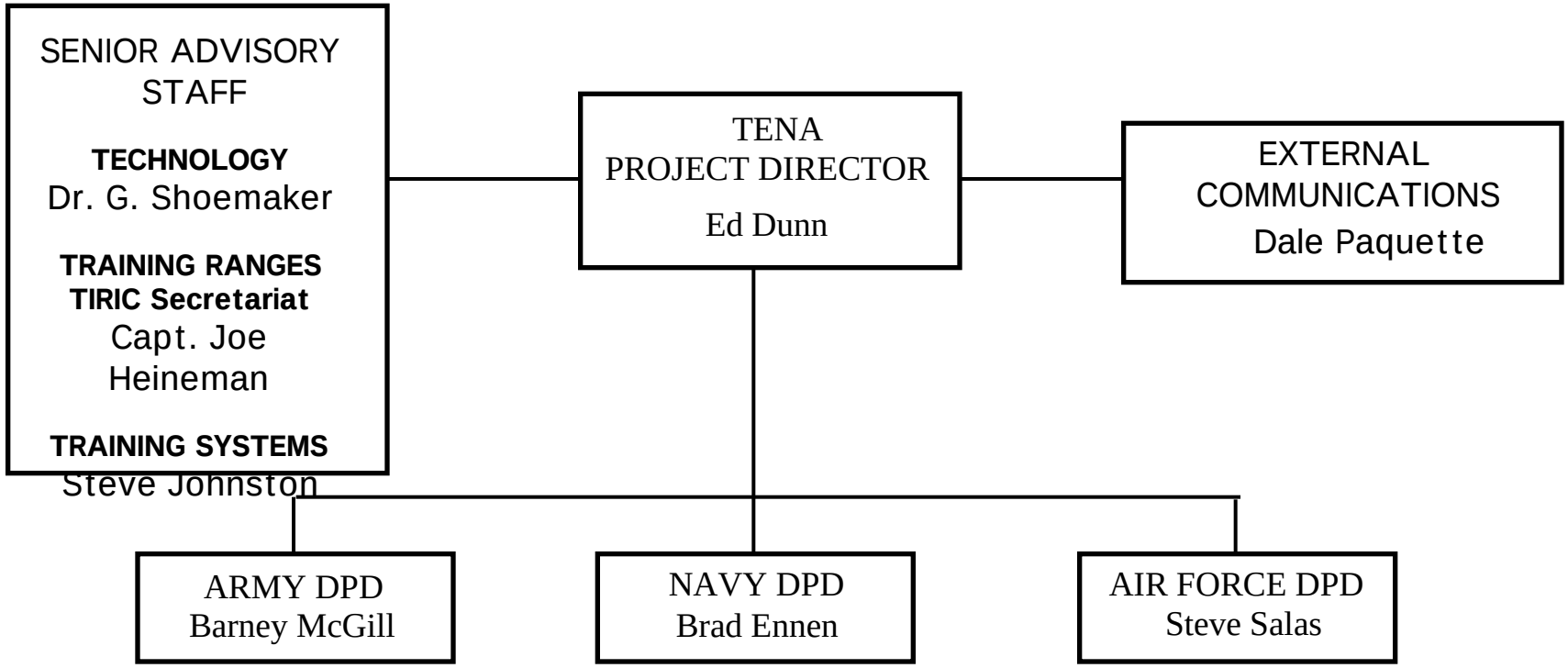
- *Environmental representations*
- *Communication networks*
- *VV&A methods*
- *Repositories*
- *Help Desk*
- *Education*

T&T infrastructure services
T&T application-level common software
T&T object repositories

Payoffs: Interoperability and reuse = capability and cost-effectiveness

Ref: Capt Hollenback: DoD M&S Progress Report, Industry Brief, May 23, 1996

Management/Organization



IPT Organization

PROJECT OFFICE

- Planning
- Coordination
- Control
- Reporting
- Communications

REQUIREMENTS

- Non-OAR
- Training Systems
- OAR
- Visionary
- Business Process
- Networks

ARCHITECTURE

VALIDATION/ EVALUATION

- Scenario Development
- Business Process
- Communications/Networks
- Integrated Validation Plan
- Preliminary Test Plans

TRANSITION

Derived Architecture Requirements

- **Adaptability**
- **Administrative Support**
- **Communications Management**
- **Composability**
- **Development Activities**
- **Human Computer Interface**
- **Integrability**
- **Interoperability**
- **Partitioning and Allocation of Responsibilities**
- **Recording, Replay, and Review**
- **Reliability and Availability**
- **Resource Management**
- **Reusability**
- **Scalability**
- **Security**
- **System Components and Implementation Guidelines**
- **Test Planning Support**
- **Time Management**
- **Usability**

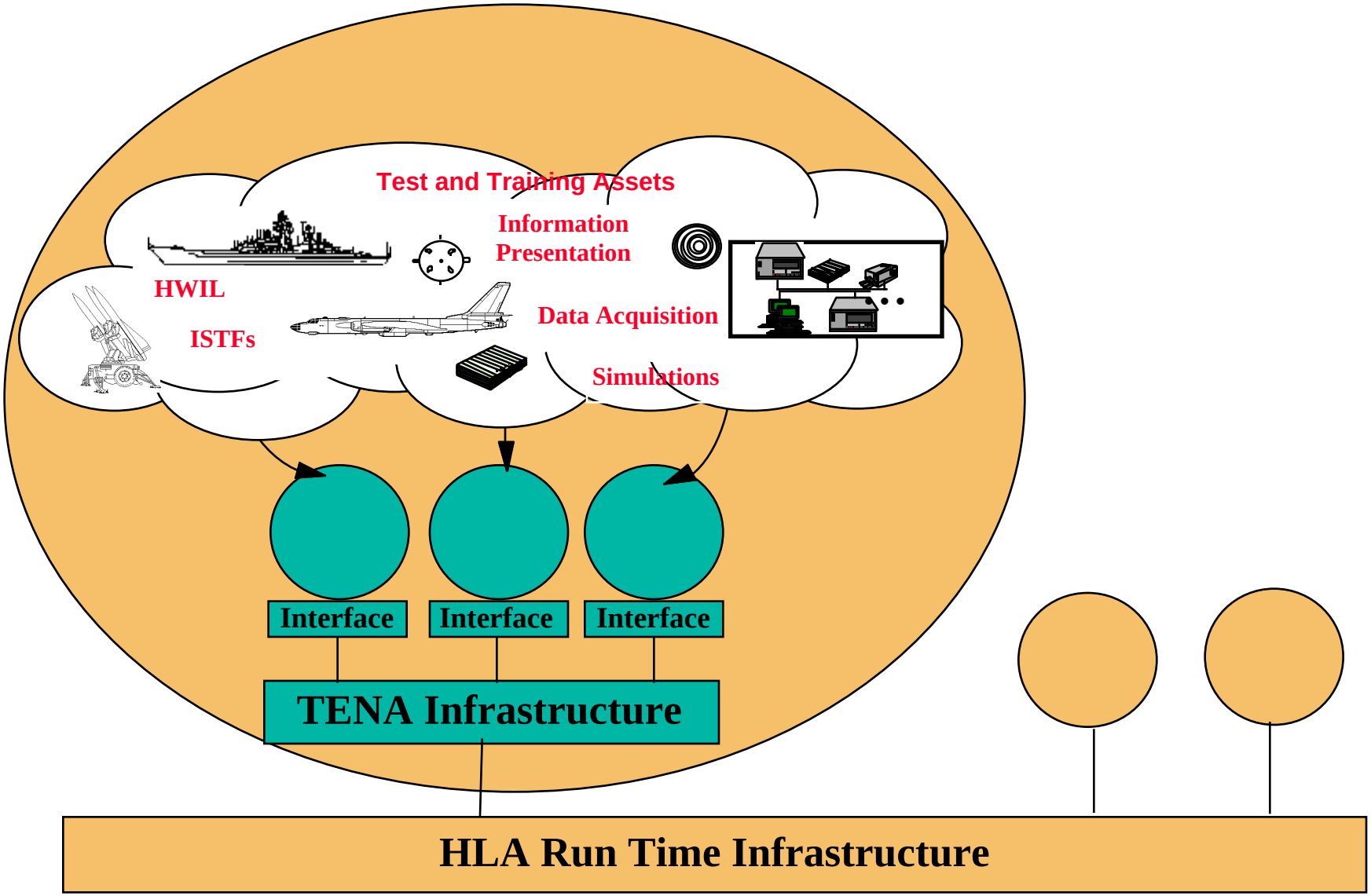
Novel Characteristics of the TENA Domain

- **Hardware Focus**
  - **range assets tend to be hardware**
  - **assets are extremely expensive to duplicate**
- **Safety**
  - **safety imposes unique requirements**
  - **trusted software will be required for some components of the architecture**
  - **restricted access to data**
- **Lack of Commonality Across Ranges**
  - **few industry standards**
  - **uniqueness used to differentiate amongst ranges**

Novel Characteristics of the TENA Domain

- **Operation**
  - **tests tend to be short-lived (hours as opposed to days)**
  - **tests can require near real-time changes to test configuration**
  - **test director may require exclusive control of some test assets**
- **Exercise Management**
  - **management tools will be required to handle scheduling**
  - **test federates are not always well-behaved--system under test may be "buggy"**

Conceptual TENA Architecture



Restricting Access

- **Range safety needs require restrictions on access to shared information**
  - **restrict access of range assets to particular tests**
  - **restrict the flow and access of data to range assets**
- **Possibilities**
  - **TENA infrastructure to enforce access restrictions**
  - **investigate if this requirement extends beyond TENA domain**
- **Infrastructure may be more desirable because developing trusted infrastructure may be cheaper than trusted RTI**

High Speed/Volume Data Requirements

- **TENA has high speed and volume data transfer requirements that may preclude the transfer of some data types across the RTI**
  - **telemetry data streams**
  - **video**
- **Possibilities**
  - **telemetry data and video are not part of the TENA FOM**
  - **evaluate applicability of approach used in the MRCI experiment for video data**
  - **separation of control and transport**
    - **initiate data transfer through RTI but actual data transfer occurs through different channel**
  - **data distribution management (DDM)**

Test Execution Flexibility

- **Test configurations must remain flexible**
  - **asset availability changes**
  - **opportunities for capturing test data occur with little notice**
- **Possibilities**
  - **working with user community to refine requirement and develop use case**
  - **studying possibilities of FOM organization**
  - **studying application multiple simultaneous federation executions**